



Examples of affected areas

Cervical

- C1-C3 Neck Muscles
- C4 Diaphragm
- C5 Deltoid (Shoulder)
- C6 Wrist
- C7 Triceps
- C7-C8 Fingers

Thoracic

- T1 Hand
- T2-T12 Intercostals (Trunk)
- T7-L1 Abdominal
- T11-L2 Ejaculation

Lumbar

- L2 Hips
- L3 Quadriceps
- L4-L5 Hamstrings – Knee
- L4-S1 Foot

Sacral

- S2 Penile Erection
- S2-S3 Bowel and Bladder

Coccygeal

Central Cord Syndrome

“The Arms Have It”

Fell forward

75 yr o female. Out for morning walk & tripped over the uneven cement in side walk. Arrived to regional ED @ 11:00 am. c/o pain in neck, back shoulders & mandible. Small (.5cm) lac. to underside of chin, & abrasion to hands. C-spined at scene. "Neuro-vascularly intact"

CT head, C-spine, chest/abd/pelvis

All neg. Has complex mandible fx. Requires transfer to trauma center for repair. GCS 15 - no airway issues. Cont c/o shoulders hurt, arms "heavy" slight "burning sensation". CHARTED:

"MAE to command can wiggle fingers & toes"





Transported by ground – “c-spine cleared” (no fx degenerative changes only). Arrived to trauma center 5 hrs post injury. (to ER but to be seen by ENT. Vitals stable, cont c/o shoulder discomfort, heaviness in arms still “MAE to command & wiggle fingers & toes” BUT.....

Registration staff report P.U.T.S.

Could not hold on to pen to sign permission to treat.

Patient thought it was because her hands were “cold”



1/2 hour later upon ENT exam patient unable to move fingers or wrists, weak elbow movement & shoulder shrug. Documented as 3/5 strength by MD.

Lower extremity strength 5/5 (per MD)

58 yr old lady to ER by ambulance after falling and hitting chin forehead & shoulder on the door jam. + LOC and quadriplegia on scene. Brief LOC upon awakening was unable to move upper & lower extremities. Ambulance was summoned

Trauma Team activated (0140) Arrival to ER w C-spine precautions @ (0215)

Awake upon arrival to ER. GCS 15

Bruise above R eye w/ swelling, nosebleed, abrasion R cheek

Neuro: Unable to move fingers, “can move arms & legs”

Complains of bilateral arm pain & paresthesias.

Able to move legs

BP 107/64, P 49, R 20, T 98



0220 IV started (pain disproportional) “Pt very sensitive to any touch of lower arms)

0245 Provider exam “Taken off backboard, C-collar left on

0250 “Assisted to sitting. Able to stand with assist. Continues to c/o neck, shoulder & back pain. C-collar in place

0255 to x-ray via wheelchair (1 view c-spine, shoulder)

0320 back from x-ray, c-collar still in place. Pain still 10/10, skin sensitive



Cross table c-spine: degen. Changes
Shoulder “ok”.

Pt “uncooperative” for x-rays d/t pain

Transferred to Benefis by ground
At 0325 d/t inability to clear
C-spine



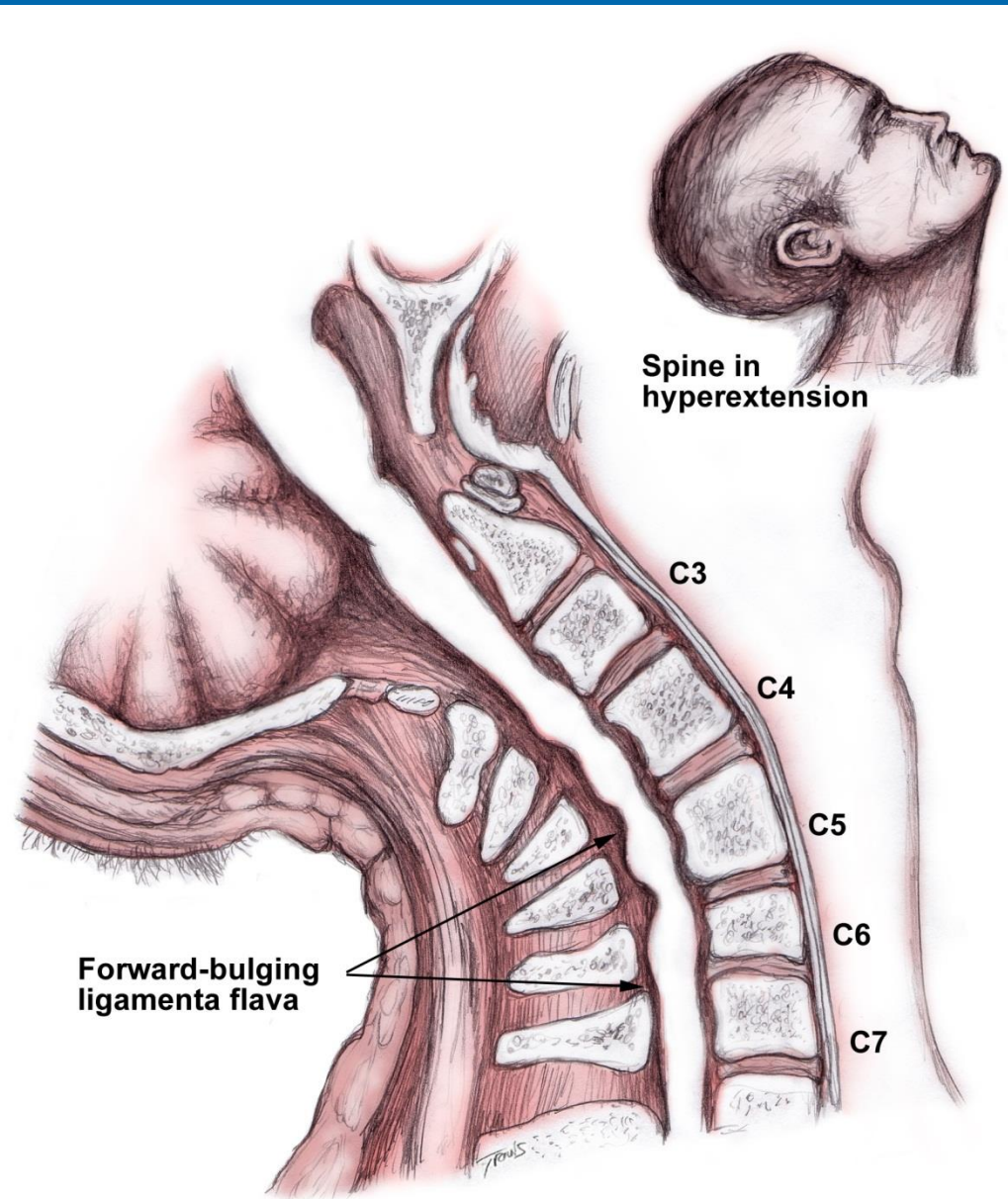
Ideas?

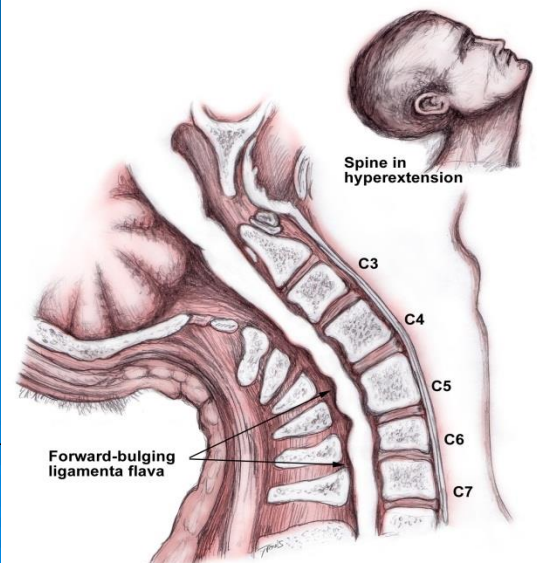
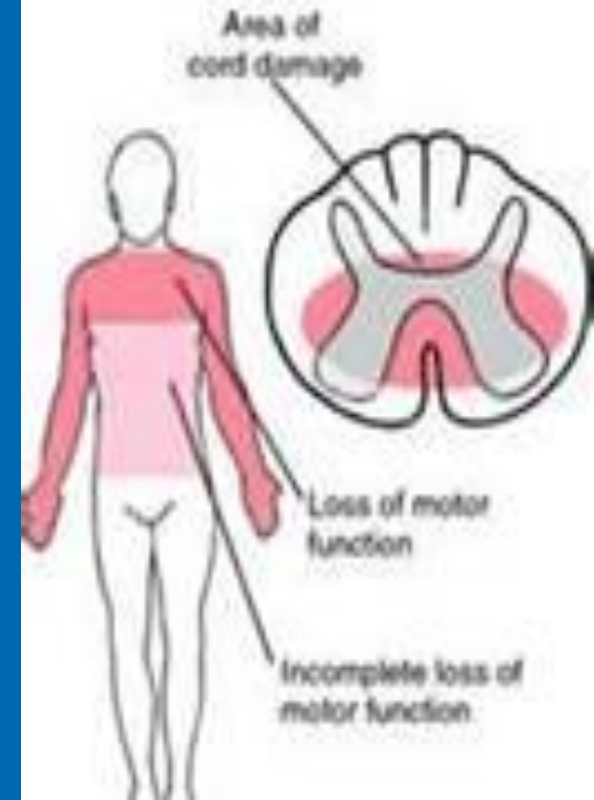
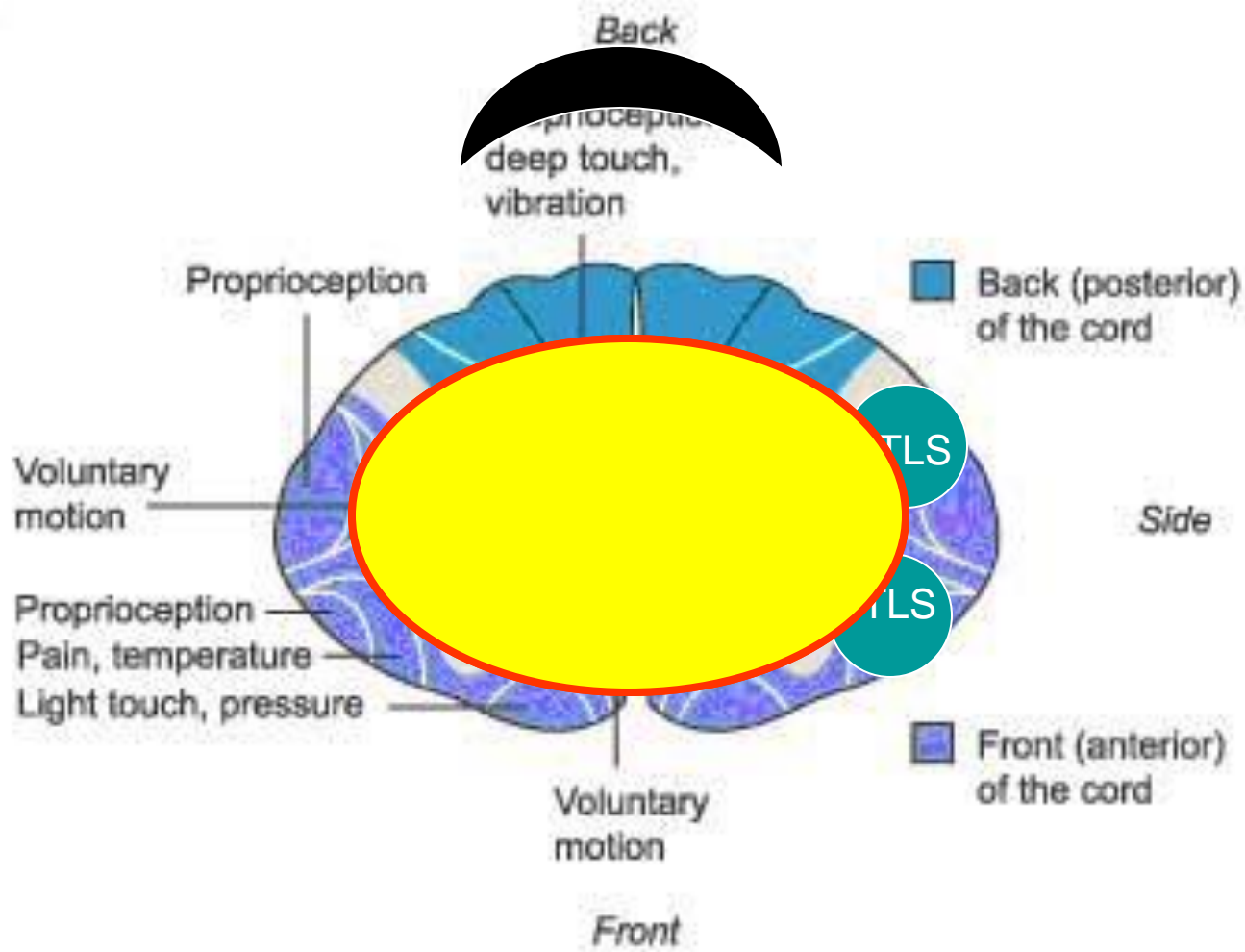
Central Cord Syndrome

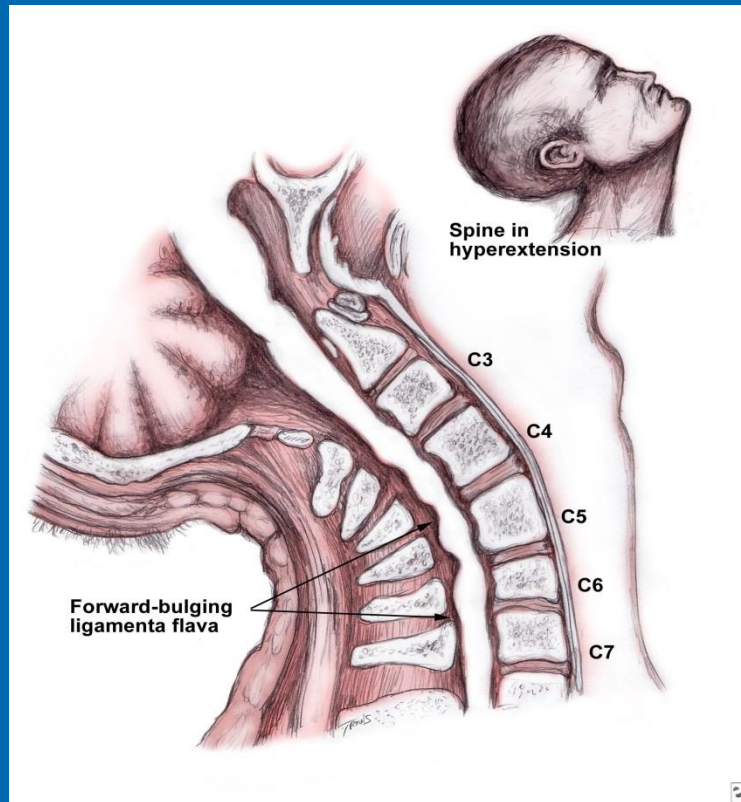
Usually Hyperflexion tho
Can occur w hyperextension

Diving, Skiing, MVC....

Most often in “older” adults
With degenerative (or early)
Degenerative changes
In C-spine



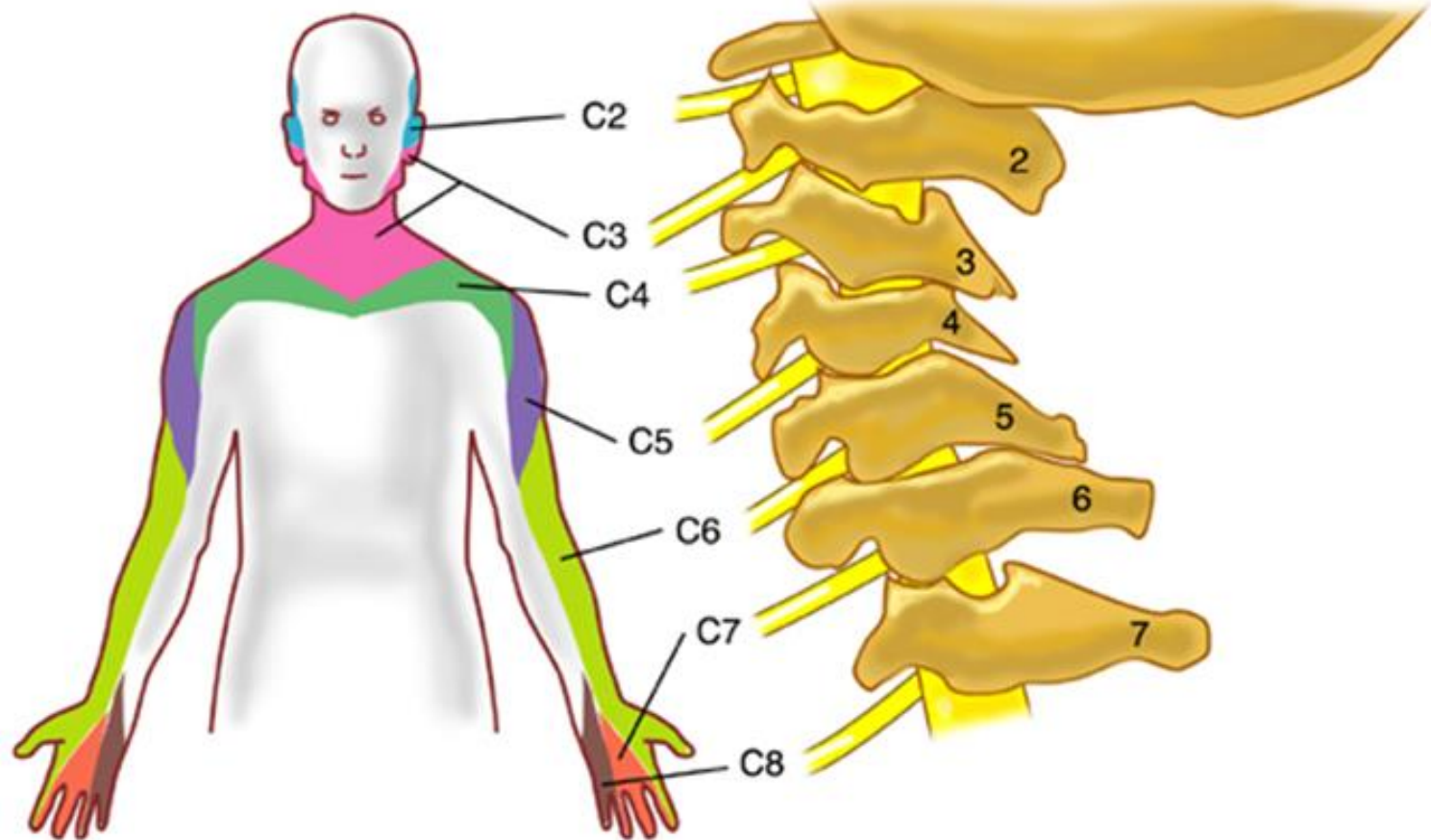




dynia dysesthesia

A





Patient Name _____

Examiner Name _____ Date/Time of Exam _____



STANDARD NEUROLOGICAL CLASSIFICATION
OF SPINAL CORD INJURY



MOTOR

KEY MUSCLES
(scoring on reverse side)

	R	L	
C5	<input type="checkbox"/>	<input type="checkbox"/>	Elbow flexors
C6	<input type="checkbox"/>	<input type="checkbox"/>	Wrist extensors
C7	<input type="checkbox"/>	<input type="checkbox"/>	Elbow extensors
C8	<input type="checkbox"/>	<input type="checkbox"/>	Finger flexors (distal phalanx of middle finger)
T1	<input type="checkbox"/>	<input type="checkbox"/>	Finger abductors (little finger)
UPPER LIMB TOTAL	<input type="checkbox"/> + <input type="checkbox"/> = <input type="checkbox"/>		
(MAXIMUM)	(25)	(25)	(50)

Comments:

L2	<input type="checkbox"/>	<input type="checkbox"/>	Hip flexors
L3	<input type="checkbox"/>	<input type="checkbox"/>	Knee extensors
L4	<input type="checkbox"/>	<input type="checkbox"/>	Ankle dorsiflexors
L5	<input type="checkbox"/>	<input type="checkbox"/>	Long toe extensors
S1	<input type="checkbox"/>	<input type="checkbox"/>	Ankle plantar flexors

Voluntary anal contraction (Yes/No) ☐

LOWER LIMB TOTAL ☐ + ☐ = ☐
(MAXIMUM) (25) (25) (50)

	LIGHT TOUCH		PIN PRICK	
	R	L	R	L
C2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S4-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

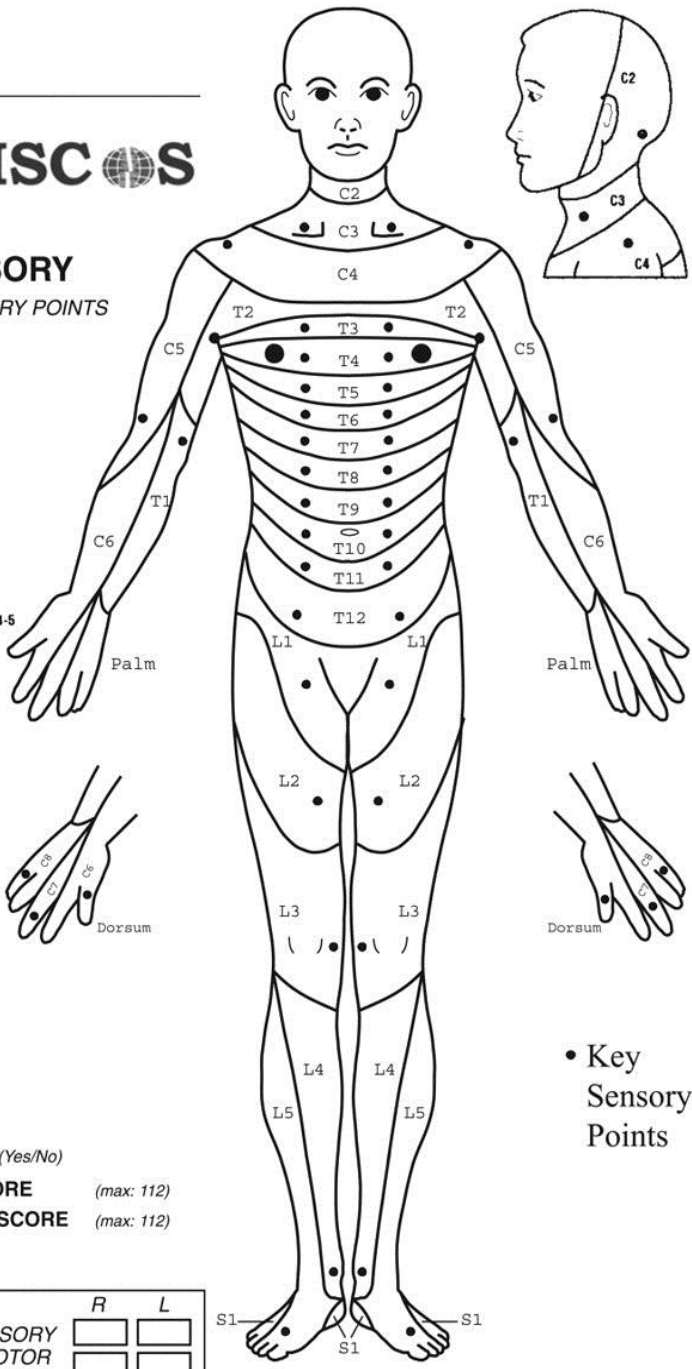
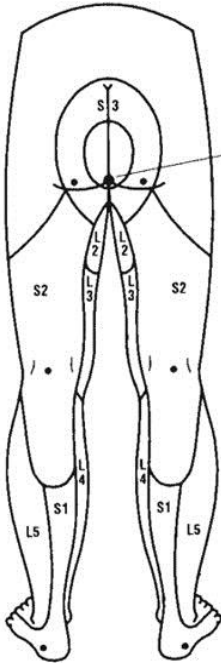
TOTALS { ☐ + ☐ = ☐ } ☐ + ☐ = ☐
(MAXIMUM) (56) (56) (56) (56)

☐ Any anal sensation (Yes/No)
☐ PIN PRICK SCORE (max: 112)
☐ LIGHT TOUCH SCORE (max: 112)

SENSORY

KEY SENSORY POINTS

0 = absent
1 = impaired
2 = normal
NT = not testable



• Key Sensory Points

NEUROLOGICAL LEVEL The most caudal segment with normal function	SENSORY	R	L	COMPLETE OR INCOMPLETE? <input type="checkbox"/> Incomplete = Any sensory or motor function in S4-S5	ZONE OF PARTIAL PRESERVATION Caudal extent of partially innervated segments	SENSORY	R	L
	MOTOR	<input type="checkbox"/>	<input type="checkbox"/>			MOTOR	<input type="checkbox"/>	<input type="checkbox"/>
ASIA IMPAIRMENT SCALE				<input type="checkbox"/>				

TREATMENT

Continued C-spine Protection to prevent further damage

CT scan, C-spine

MRI C-spine

Avoid hypoxia, hypotension

Cervical collar (Miami-J, Aspen)

Steroids ??????? +/-

Surgery +/-

